



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,783	08/30/2000	Shuichi Kauno	NIP-198	2461
24956	7590	02/23/2005	EXAMINER	
MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C. 1800 DIAGONAL ROAD SUITE 370 ALEXANDRIA, VA 22314			NGUYEN, NGOC YEN M	
			ART UNIT	PAPER NUMBER
			1754	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/651,783

Applicant(s)

KANNO ET AL.

Examiner

Ngoc-Yen M. Nguyen

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3,4 and 11-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3,4, 11-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

Art Unit: 1754

### DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 7, 2005 has been entered.

The amendment filed January 7, 2005 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: in the paragraph beginning at page 5, line 10, "[P]referably, the velocity... 10 to 30 meters per second".

Applicant is required to cancel the new matter in the reply to this Office Action.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 15 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which

Art Unit: 1754

was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicants are requested to point out support in the instant specification, by page and line numbers, for the limitations "from 10 meters per second to 30 meters per second" as required in the instant claim 15 (note the objection to the specification for introducing new matter, as stated above).

Claim 17 is objected to because of the following informalities: line 12 of claim, "ad" and "aqueous" are misspelled. Appropriate correction is required.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4, 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 885 648 in view of either JP 11-216,455 or Lang et al (6,235,256).

EP '648 discloses a process for decomposing fluorine compounds, comprising the steps of contacting a gas flow containing the fluorine compounds, which comprises fluorine as a halogen element, and any of the elements carbon, nitrogen and sulfur as a compound with the fluorine, with a fluorine compound-decomposition catalyst in the

Art Unit: 1754

presence of steam to hydrolyze the fluorine compound in said gas flow, wherein said gas flow containing said fluorine compounds is contacted with a catalyst comprising Al to convert said fluorine compounds to hydrogen fluoride (note claim 1). In the equation 4 and 5 on page 3 of EP '648, when  $\text{SF}_6$  or  $\text{NF}_3$  is being decomposed,  $\text{SO}_3$  or NO is formed. In the embodiments 6 and 7,  $\text{SF}_6$  or  $\text{NF}_3$  is diluted with air or nitrogen, the resulting gas is contacted with a catalyst to decompose the fluorine compound. The decomposed gas is scrubbed in an alkaline scrubber (note page 10, lines 1-25).

EP '648 discloses that sulfur oxides such as  $\text{SO}_2$ ,  $\text{SO}_3$  and the like, and nitrogen oxides, such as NO,  $\text{NO}_2$ , and the like, are generated in some cases. In order to neutralize and eliminate these products, a method of scrubbing the decomposed gas by spraying an aqueous alkaline solution is desirable (note paragraph bridging pages 3-4). Thus, the scrubbing step is considered as the step of removing  $\text{SO}_x$  and  $\text{NO}_x$  from the washed gas.

For the instant claim 17, this claim is read in light of the specification that there are two separate catalysts, i.e. catalyst "8" and catalyst "9", to remove different components in the PFC gas simultaneously in a single process step (note instant specification, page 14, under "(Embodiment 1)"). If claim 17 is intended to claim that there are two consecutive process steps, one for PCF decomposing process and one for toxic component decomposing process, there would be no sufficient support in the instant specification for such embodiment. EP '648 discloses that the stream to be treated can contain more than one fluorine compound and the catalyst can contains at least one element selected from the group consisting of Zn, Ni, Ti, Fe, Sn, Pt, Co, Zr,

Art Unit: 1754

Ce, and Si in addition to Al (note page 3, lines 8-15). Thus, when more than 1 element was used in addition to Al, the first element with Al is considered as the claimed "decomposition catalyst" and the second element with Al is considered as the claimed "toxic component decomposition catalyst".

The difference is EP '648 does not disclose the step of removing SO<sub>x</sub> or NO<sub>x</sub> from the decomposed gas after scrubbing by passing the gas after the scrubbing step through a cyclone or demister.

JP '455 discloses a process for treating an exhaust gas generated in a process of making printed circuit board by passing the exhaust gas through a catalytic thermal decomposition device 4 and the waste gas cleaning device 5 and discharged as a harmless exhaust gas 6 (note English abstract). As shown in Figure 3, the exhaust gas after scrubber 5 is introduced into a cyclone 8. Here the moisture within the exhaust gas is removed and recycled back to the scrubber 5 thereby minimizes the requirement of fresh scrubbing liquid. JP '455 further teaches that a demister can be used instead of a cyclone (note paragraph 0036).

For the instant claims 15-16, it would have been obvious to one of skill in the art to optimize the inlet velocity to effectively remove the moisture from the exhaust gas and to select an appropriate material for the construction of the cyclone to withstand the condition of the process.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to pass the exhaust gas after the scrubbing step in EP '648 to a cyclone or demister, as suggested by JP '455, because by doing so, the moisture can

Art Unit: 1754

be removed from the gas and recycled to the scrubber thereby minimizes the requirement of fresh scrubbing liquid. Such step would inherently remove any remaining NO<sub>x</sub> or SO<sub>x</sub> from the washed gas.

Alternatively, Lang '256 can be applied. Lang '256 discloses a process for scrubbing acid gases. In the process, the improvement is a demister arranged at a location after the liquid droplets have been sprayed by the spray means into the flow path of the flue gases (note column 3, lines 8-43 and claim 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to pass the exhaust gas of EP '648 to a demister, as suggested by Lang '256 in order to obtain the advantages as disclosed in Lang '256 (note, for example, column 1, lines 44-50).

Claims 3-4, 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno et al (PGPub US 2001/0001652) in view either JP 11-216,455 or Lang et al (6,235,256).

Kanno '652 is an US counterpart of EP '648.

Kanno '652 discloses a process as mentioned for EP '648 (note claim 1, Examples 11-12).

The difference is Kanno '652 does not disclose the step of removing NO<sub>x</sub> or SO<sub>x</sub> after the scrubbing steps.

JP '455 or Lang is applied to teach the step of passing the gas after the scrubbing step to a cyclone or demister.

Art Unit: 1754

Applicant's arguments filed January 7, 2005 have been fully considered but they are not persuasive.

Applicants stated that the added subject matter to the instant specification was inadvertently omitted in the English-language translation, which became the present application.

The added subject matter to the specification is still considered as new matter because the foreign priority document was not incorporated by reference into the instant specification, and because there is no clear evidence that the range of "10 to 30 meters per second" is the only one and obvious range to correct the alleged omission.

Applicants argue that neither secondary reference discloses or suggests the improvement of removing at least one of SO<sub>x</sub> and NO<sub>x</sub> accompanying water or mist.

Even though the secondary references do not disclose or suggest the removal of at least one of SO<sub>x</sub> and NO<sub>x</sub> accompanying water or mist, however, they fairly teach the desire of removing the moisture from the exhaust gas for the reasons as stated in the above rejection. Applicants discover another reason to do what the art suggests to do does not make the original reason unknown or unobvious, *In re Dillon*, 16 USPQ 1897, en banc (Fed. Circ. 1990). The removal of at least one of SO<sub>x</sub> and NO<sub>x</sub> accompanying water or mist would be an inherent effect when the moisture is removed as disclosed in the second reference.



Art Unit: 1754

Applicants argue that prior art has problem in which the washing step permits toxic components in the decomposition products to form a mist with water, which clears the washing tower.

As stated in the above rejection, the secondary references are applied to teach the desire to add a demister, thus the combined teaching of the applied references would eliminate the problem in the prior art as mentioned by Applicants.

Applicants argue that JP '455 recycles the water, which was removed from the cyclone, while the claimed invention removes the disposal water.

It should be noted that Applicants' claims do not exclude the step of recycling the water. In JP '455 the cyclone removes the water mist from the exhaust gas, and it would inherently remove any residual decomposition products, as required in Applicants' claims.

Applicants argue that JP '455 does not disclose the decomposition of a PFC gas resulting in the decomposition of at least one of  $\text{SF}_6$  and  $\text{NF}_3$ , which are subsequently washed by contact with at least one of water and an aqueous alkaline solution.

JP '455 is not relied upon to teach the decomposition of PFC gas. In both EP '648 and JP '455, a scrubbing step is used and JP '455 teaches the step of removing the moisture of the exhaust gas from the scrubbing step and the step of recycling the recovered moisture to minimize the requirement of fresh scrubbing liquid, thus, it would have been obvious to do the same for the process of EP '648 in order to achieve the same advantage.

Art Unit: 1754

Applicants argue that EP '648 and JP '455 do not disclose that the decomposition is performed in two processes as set forth in new claim 17.

EP '648, as stated in the above rejection, discloses that the catalyst can have more than one additional component beside the Al. Thus, one component can be considered as the first required catalyst and the second component can be considered as the second required catalyst.

Applicants argue that the dehydration by cyclone in JP '455 is to remove moisture only.

When the dehydration by cyclone as disclosed in JP '455 is applied to the process of EP '648, the removal of at least one of SO<sub>x</sub> and NO<sub>x</sub> accompanying water or mist would be inherent. It should be noted that the motivation for combining the applied reference does not have to be the same as that of the claimed invention.

Applicants argue that Lang discloses a water spraying process located downstream of the demister 4, which results in mist being left in the exhaust gas.

It should be noted that Lang specifically discloses that the improvement is " a demister arranged at a location after the liquid droplets have been sprayed by the spray means into the flow path of the flue gases" (note column 3, lines 14-16 and claim 1). There is no requirement of another water spraying process after the second demister to further introduce water mist to the exhaust gas as alleged by Applicants.

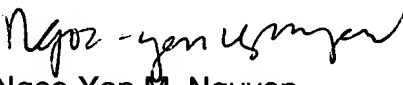
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 1754

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stan Silverman can be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed (571) 272-1700.

  
Ngoc-Yen M. Nguyen  
Primary Examiner  
Art Unit 1754

nmn  
February 22, 2005